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Some impatience has been shown about the accessibility of these collections of books and eggs. Their sudden accession raised several difficult problems. Not only does it take time to sort and rearrange such an influx, but it requires space in an already more than crowded museum: and (given time and space) also binding, cabinets, show-cases, catalogues, all costing money, which is well known to be scarce in the case of our *Alma Mater*.

III.—*On the Birds of Paraguay.* By CHARLES CHUBB,
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(Text-figure 1.)

THE collection on which this paper is based was made by Mr. W. Foster in the neighbourhood of Sapucay in 1902, 1903, and 1904. I was in hopes that Mr. Foster would have been able to send me some account of the locality and the circumstances under which the collection was made, but I have not yet heard from him on the subject.

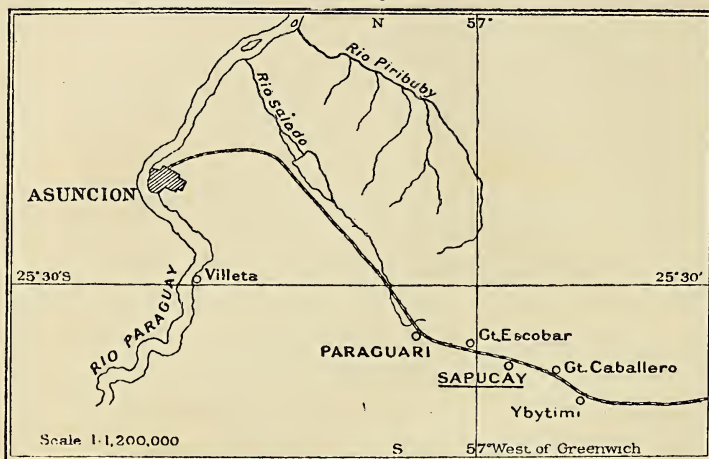
Sapucay, as will be seen by the map (text-fig. 1, p. 54), is situated in about 57° W. Long. and 27° S. Lat. It is on the railway between Asuncion and Ybytimi.

Since the time of Azara, several isolated papers have appeared dealing with the birds of Paraguay, but I do not believe that any collection of such magnitude as that

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made by Mr. Foster has been received in Europe, and therefore I hope that my present essay will be of some service to ornithology.

Text-fig. 1.



Map of part of Paraguay, showing the position of Sapucay.

The following are some of the principal memoirs which deal with Paraguayan ornithology:—

- AZARA, F. DE.—Apuntamientos para la historia natural de los Pájaros del Paraguiay y Rio de La Plata. Madrid, 1802–1805.
- VIEILLOT, L. P.—Nouveau Dictionnaire d'Histoire Naturelle. Paris, 1816–1819.
- HARTLAUB, CARL J. G.—Systematischer Index zu Don Felix de Azara's Apuntamientos para la historia natural de los pájaros del Paraguay y Rio de la Plata. Bremen, 1847.
- CATALOGUE of the Birds in the British Museum. London, 1874–1898.
- BERLEPSCH, HANS, Graf von.—Systematisches Verzeichniss der von Herrn Ricardo Rohde in Paraguay gesammelten Vögel. Journal für Ornithologie, 1887, pp. 1–37, 113–134.
- BERTONI, A. W.—Aves Nuevas del Paraguay. Asuncion, 1901, pp. 1–216.
- OBERHOLSER, H. C.—List of Birds collected by William T. Foster in Paraguay. Proc. U.S. Nat. Mus. xxv. pp. 127–147 (1902).
- IHERING, H. von.—As aves do Paraguay em comparação com as de São Paulo. Revista do Museu Paulista, vi. pp. 310–344 (1904).

During the preparation of this paper, I have had the advantage of being able to consult Dr. Bowdler Sharpe on all difficult questions, and Mr. C. E. Hellmayr has also very kindly supervised my manuscript.

The original notes written by Mr. Foster during his stay in England are given in brackets [] with his initials "W. F."

1. TINAMUS SOLITARIUS.

Ynambú mocoicogoé Azara, Apunt. iii. p. 56. no. cccxxxii. (1805).

Cryptura solitaria Vieill. N. Dict. d'Hist. Nat. xxxiv. p. 105 (1819).

Tinamus solitarius Salvad. Cat. B. Brit. Mus. xxvii. p. 501, pl. vii. (1895); Oates, Cat. Eggs Brit. Mus. i. p. 229 (1901); Bertoni, Aves Nuevas del Paraguay, p. 23 (1901); Ihering, Revista Mus. Paulista, vi. p. 344.

Mr. Foster says that he has never met with this Tinamou himself, but has found its nest on three occasions. The eggs are smooth and glossy in texture and of a peacock-blue colour. He found nests and obtained eggs on Oct. 4, Nov. 15, and Dec. 26, 1904. Their measurements are: axis 2.45-2.6 inches; diameter 1.75-1.95.

Mr. Bertoni (*l. c.*) writes:—"I met with a nest on Nov. 1, at the foot of a tree, with no other foundation but the fallen leaves. It contained four eggs of a lovely bluish green, and measuring 56 × 48 millim."

2. CRYPTURUS TATAUPA.

Ynambú Tataúpa Azara, Apunt. iii. p. 48. no. cccxxix. (1805).

Tinamus tataupa Temm. Fig. et Gall. iii. pp. 590, 752 (1815); Hartl. Ind. Azara, p. 21. no. 329 (1847)

Crypturus tataupa Vieill. N. Dict. d'Hist. Nat. xxxiv. p. 108 (1819); Berlepsch, J. f. O. 1887, p. 37 (Pilcomayo); Salvad. Cat. B. Brit. Mus. xxvii. p. 525 (1895); Seth-Smith, Avic. Mag. (2) ii. p. 285, cum tab. (1904); Ihering, Revista Mus. Paulista, vi. p. 344.

a. ♀ ad. Sapucay, April 19, 1903.

Bill reddish pink ; iris warm brown.

b. ♀ ad. Sapucay, July 8, 1904.

Bill bright red ; feet purplish red ; iris reddish brown.

According to Azara, this is the "House-partridge" of the Guaranis, and inhabits the forests and woods and even plantations which have masses of rank grasses where the bird can hide. He also says that it lays but four eggs. According to Mr. Foster, however, five or six are more frequently laid. Azara remarks that when any person passes close to the nest the mother attacks and attempts to drive away the object of her fears. Mr. Foster did not observe this habit.

The eggs of this species sent by Mr. Foster were obtained during the months of October, November, and December. They vary in colour from pale lavender-grey to a vinous colour and measure : axis 1.45 to 1.7 inches ; diameter 1.1 to 1.25.

Full-grown young birds (hatched in confinement), presented to the British Museum by Sir William Ingram, are distinguished by their dark brown, instead of chestnut, upper surface, the dark lead-coloured head, fore-neck, breast, and flanks. On the chest are a few feathers with dusky black subterminal bars, and a few white spots may be seen on some of the wing-coverts and secondaries, occasionally preceded by a black subterminal bar, the greater coverts and secondaries also shew a few scattered spots of dull white.

[Six appear to be a full clutch. I never found any of the eggs hard-set, but sometimes incubation had commenced in clutches of five, so I fancy that six eggs are rarely exceeded. There is no nest, only a depression scratched in the ground, usually near the edge of some of the numerous cattle-tracks and therefore easily discovered. The bird is common. There is much variation in colour between the different clutches of eggs.—*W. F.*]

3. *CRYPTURUS UNDULATUS.*

Ynambú listado Azara, Apunt. iii. p. 53. no. cccxxx. (1805).

Tinamus undulatus Temm. Fig. et Gall. iii. p. 582 (1815) ; Hartl. Ind. Azara, p. 21. no. 331.

Cryptura sylvicola Vieill. N. Dict. d'Hist. Nat. xxxiv. p. 107 (1819).

Crypturus undulatus Salvad. Cat. B. Brit. Mus. xxvii. p. 525 ; Kerr, Ibis, 1892, p. 151 (Rio Pilcomayo) ; Ihering, Revista Mus. Paulista, vi. p. 344.

a. ♀ ad. Sapucay, March 10, 1903.

Bill black above, of a horn-colour below ; feet of a pale greenish slate-colour ; iris hazel-brown.

The single specimen sent by Mr. Foster is not altogether identical with the example obtained by Prof. Graham Kerr on the Lower Pilcomayo. The latter specimen is the only one in the British Museum with which I could compare the Paraguay bird, so that I cannot draw any conclusions as to their specific identity or distinctness, as Prof. Kerr's bird is in very poor condition ; but I should not be surprised to hear that they are considered distinct, as the Sapucay bird is not only more rufescent, but has less barring on the breast and abdomen. Further specimens are necessary, however, to determine this question.

Azara says that, according to the natives, this bird frequents the large forests only, and is solitary in its habits. It lays four eggs of a glossy greyish colour [N.B.—Vieillot translates *morados lustrados* as "violet lustré," but Azara's colour is the correct one.]

Mr. Foster remarks that : "this is a very rare bird : one specimen only was brought to me one day by a boy, who had snared it in the monte. Nothing is known as to its habits."

4. RHYNCHOTUS RUFESCENS.

Ynambú-Guazu Azara, Apunt. iii. p. 34. no. cccxxvi. (1805).

Tinamus rufescens Temm. Fig. et Gall. iii. pp. 552, 747 (1815)

Cryptura guazu Vieill. N. Dict. d'Hist. Nat. xxxiv. p. 103 (1819).

Rhynchotus rufescens Salvad. Cat. B. Brit. Mus. xxvii. p. 548; Oates, Cat. Eggs Brit. Mus. i. p. 12 (1901); Ihering, Revista Mus. Paulista, vi. p. 344.

Mr. Foster's note regarding this bird is as follows :—

[This species is resident and fairly common in all parts of the Republic, though being gradually killed off in the neighbourhood of the small towns. This bird is one of the most difficult to hunt with dogs, as it travels so quickly through the high matted grasses that by the time the sportsman reaches the dog and walks up to flush the bird, it may be some distance away; this is often repeated several times until the hunter gives up in disgust. The eggs are placed in a slight depression of the ground under one of the thick masses of grass; six eggs are rarely exceeded.—*W. F.*]

Thirteen eggs were received from Mr. Foster. They were collected during the months of October, November, and December, and vary in colour from deep lavender-grey to lilac-grey. Axis 2·2 to 2·4 inches; diameter 1·6 to 1·75.

5. *NOTHURA MACULOSA.*

Ynambú Azara, Apunt. iii. p. 40. no. cccxxvii. (1805).

Tinamus maculosus Temm. Fig. et Gallin. iii. pp. 557, 748 (1815).

Cryptura fasciata Vieill. N. Dict. d'Hist. Nat. xxxiv. p. 109 (1819).

Nothura maculosa Hartl. Ind. Azara, p. 21, no. 327 (1847); Berlepsch, J. f. O. 1887, p. 37; Salvad. Cat. B. Brit. Mus. xxvii. p. 559 (1895); Oates, Cat. Eggs Brit. Mus. i. p. 13 (1901); Ihering, Revista Mus. Paulista, vi. p. 344.

a. ♀ ad. Sapucay, June 9, 1904.

Bill and feet creamy white; iris buff. Shot in the open camp.

This species is resident and common. The method of hunting it is the same as that recorded by Azara. It is a stupid bird and can be knocked over with a lasso after the horseman has galloped round it two or three times.

Mr. Foster obtained two clutches of three eggs each. One was taken on November 28, 1904, and the other on

December 3 of the same year. The eggs are deep coffee-brown in colour and measure: axis 1.55 to 1.8 inches; diameter 1.15 to 1.25.

6. COLUMBA SYLVESTRIS.

Paloma de la montés Azara, Apunt. iii. p. 11. no. cccxix. (1805).

Columba sylvestris Vieill. N. Dict. d'Hist. Nat. xxvi. p. 366 (1818, ex Azara); Hartl. Ind. Azara, p. 20 (1847); Salvad. Cat. B. Brit. Mus. xxi. p. 289, note (1893).

Columba rufina (nec Temm.), Berlepsch, J. f. O. 1887, p. 124 (Paraguay); Salvad. Cat. B. Brit. Mus. xxi. p. 289 (1892); Ihering, Revista Mus. Paulista, vi. p. 341.

Columba rufina sylvestris Hellmayr, Nov. Zool. xiii. p. 47 (1906); id. op. cit. xv. p. 91 (1908: Goyaz).

a. ♂ imm. Sapucay, April 25, 1903.

Bill black; tarsi and feet purplish red; iris red.

This example differs from the adult bird chiefly in having the vinous colour of the head, neck, and upper breast much less pronounced. The British Museum has also a specimen of this species, in fully adult plumage, obtained at Villa Rica, Paraguay, in October 1906, and presented by the Hon. Wyndham Knatchbull-Hugessen.

I refer specimens from Medellin and Bogota to *C. rufina*. All the forms are closely allied. The differences consist chiefly in the marking of the tail and the colour of the under tail-coverts.

In the Paraguayan bird the grey tips to the tail-feathers are preceded by a very distinct shade of black, which brings out the tip of the feather in strong relief.

This bird, which is *C. sylvestris* of Vieillot, is represented in the Museum from Brazil, Ytarare (*Natterer*), Chapada, Matto-Grosso (*H. H. Smith*), Pelotas, Rio Grande do Sul (*Joyner*), Island of Mexiana (*A. R. Wallace*), and Para (*R. Graham*). It also extends to Peru, as there is a male, in the Salvin-Godman collection, from Guayabamba, obtained by O. T. Baron. The under tail-coverts in this form are entirely leaden grey.

From this bird I propose to separate the following:—

COLUMBA PALLIDICRISSA, sp. n.

Like *C. rufina*, this bird has no distinct subterminal blackish shade on the tail such as is seen in *C. sylvestris*, although there is a slight dusky appearance before the pale end of the feathers. It differs from *C. rufina* in its much paler under tail-coverts, these being white fundamentally, with a slight tinge of pearly grey. The characters seem fairly constant throughout the series of skins in the British Museum.

This species inhabits Central America from British Honduras to Panama. Type, ♂, Costa Rica (*J. Carmiol: Mus. Salvin-Godman*).

The four allied species may be diagnosed as follows:—

- a. Cheeks and ear-coverts ashy.
- a'. Subterminal shade before the light ashy tips of the tail-feathers distinctly blackish; under tail-coverts slaty grey *sylvestris*.
- b'. Subterminal shade before the paler ends of the tail-feathers dusky blackish or dull ashy; under tail-coverts pale ashy grey *rufina*.
- c'. Scarcely any sub-terminal shade before the paler ends of the tail-feathers; under tail-coverts whitish with a slight wash of pearly grey *pallidicrissa*.
- b. Cheeks and ear-coverts vinous; under tail-coverts of a dark lead-colour, darker than the abdomen; tail-feathers black with no subterminal band *cenops*.

7. ZENAIDA AURICULATA.

Paloma parda manchada Azara, Apunt. iii. p. 17. no. cccxii. (1805); Vieill. N. Dict. d'Hist. Nat. xxvi. p. 351 (1818).

Columba maculata Vieill. (nec Gm.) Enc. Méth. i. p. 376 (1820), ex Azara.

Zenaida aurita Hartl. Ind. Azara, p. 20. no. 322 (1847).

Zenaida maculata (Vieill.), Berlepsch, J. f. O. 1887, p. 34 (Pilcomayo).

Zenaida auriculata (Des Murs), Salvad. Cat. B. Brit. Mus. xxi. p. 384 (1893); Ihering, Revista Mus. Paulista, vi. p. 341.

Zenaida virgata Bertoni, Aves Nuev. Paraguay, p. 24 (1901).

a, b. ♂ ♀ ad. Sapucay, August, 1904.

Bill black; feet red (♂), purple-red (♀); iris brown.

According to Azara, this species was very common in Paraguay and Buenos Ayres, and was found in flocks which rarely numbered fifty individuals; but it more frequently occurred in pairs, perching in the thicker part of the trees about one-fourth of the way from the top. He says also that the bird did not frequent the forest, but procured its food in the open camps and plantations. It was very tame and could be approached quite closely.

Mr. Foster is of opinion, however, that this is now quite a rare bird in Central Paraguay, and lives almost exclusively in the forests.

Mr. Bertoni has separated the Paraguayan form of this bird under the title of *Zenaida virgata*; but Dr. Ihering is of opinion that it is identical with the present species, and with this I agree.

8. COLUMBULA PICUI.

Palomba picui Azara, Apunt. iii. p. 23. no. cccxiv. (1805).

Columba picui Temm. Fig. et Gallin. i. pp. 435, 498 (1813); Vieill. N. Dict. d'Hist. Nat. xxvi. p. 383 (1818).

Columbula picui Salvad. Cat. B. Brit. Mus. xxi. p. 470; Ihering, Revista Mus. Paulista, vi. p. 341.

a. ♀ ad. Sapucay, August 13, 1904.

According to Mr. Foster, this species is resident and common in the more populated parts of the country, but rare at Sapucay, where he only obtained one specimen.

In looking over the long series of this little Dove in the British Museum, I find that the adult female is very similar to the male, but is browner on the back and head, while the crown is slightly shaded with grey. In young birds there is no grey on the head, this being brown like the back. The outer tail-feather alone is white, the second and third having dull brown edges.

I think that the specimen from Ceara, which is mentioned by Count Salvadori (Cat. B. Brit. Mus. xxi. p. 472), is specifically distinct, and, as Mr. C. E. Hellmayr has pointed

out (Abhandl. Akad. München, xxii. p. 696), is *Columbina strepitans* Spix, Av. Bras. ii. p. 57 (1825: Piauhy, N.E. Brazil).

It is similar to *C. picui*, but is distinguished by its very pale uniform grey upper surface, with scarcely any brown tint, by the steel-green bar on the wing, and by the fact that the two outer tail-feathers are white with no greyish margin, this being only faintly indicated on the third feather.

Total length 7·5 inches; culmen 0·6; wing 3·4; tail 3·3; tarsus 0·6.

9. CHAMÆPELIA TALPACOTI.

Paloma roxiza Azara, Apunt. iii. p. 20. no. cccxxiii. (1805).

Columba talpacoti Temm. Fig. i. fam. 3, p. 22, pl. 12 (1808-11); Vieill. N. Dict. d'Hist. Nat. xxvi. p. 385 (1818), ex Azara.

Chamæpelia talpacoti Salvad. Cat. B. Brit. Mus. xxi. p. 485.

Columbigallina talpacoti Ihering, Revista Mus. Paulista, vi. p. 341.

a. ♀ imm. Sapucay, May 1903. Bill of a horn-colour; feet of a pinky flesh-colour; iris dark orange.

b. ♀ ad. Sapucay, August 1904. Iris buff.

c, d. ♂ ad. Sapucay, August 1904. Bill black; feet reddish pink; iris red in one specimen and white in the other.

Mr. Foster sends us eleven eggs of this species. They are pure white without any gloss, and were obtained during the months of November, December, January, and February. The measurements are: axis 0·9 to 1·0 inch; diameter 0·65 to 0·75.

In the adult female, as determined by Mr. Foster, the plumage is browner than in the adult male, being vinous only on the lower back and rump. The general tone on the under surface in the female is ashy grey, washed with sandy brown on the throat and chest, the chin and lower abdomen being white; the under tail-coverts are chestnut with hoary-white edges, as observed by Count Salvadori.

Young males seem to be vinous below shaded with ashy ; the under tail-coverts are uniform vinous chestnut, as in the adult males.

[This bird is resident and by no means uncommon. There appears to be no favourite place for nesting, almost any situation being chosen, providing the tree or shrub is dense enough to conceal the nest, while the height at which the nest is placed also varies from $2\frac{1}{2}$ to as high as 7 feet. About Sapucay the nest is generally built along the edge of the forest, but in other parts it can be met with in clumps of bushes in the open camp-lands.—*W. F.*]

10. LEPTOPTILA CHLOROAUCHENIA.

Paloma parda tapadas roxas Azara, Apunt. iii. p. 12. no. cccxx. (1805); Vieill. N. Dict. d'Hist. Nat. xxvi. p. 399 (1818).

Leptoptila chloroauchenia Salvad. Cat. B. Brit. Mus. xxi. p. 554 ; Ihering, Revista Mus. Paulista, vi. p. 342.

a. ♀ ad. Sapucay, August 25, 1904. Wing 6·0 inches ; tail 3·85.

Bill black ; feet purplish red ; iris orange-buff.

According to Mr. Foster, this bird is a common resident in Paraguay, breeding throughout the year. The nest is placed in a tree some twelve feet from the ground and is a very fragile structure.

Several eggs were sent, all of which were collected in the month of October. They vary in colour from dull white to creamy buff, and measure : axis 1·1 to 1·25 inches ; diameter 0·9 to 0·95.

11. LEPTOPTILA CALLAUCHEN.

Leptoptila callauchen Salvad. Boll. Mus. Torino, xii. no. 292, p. 33 (1897) ; Sharpe, Hand-list B. i. p. 86 (1899).

a. ♂ ad. Sapucay, May 7, 1903. Wing 6·0 inches ; tail 3·85.

Bill black ; tarsi and feet crimson ; iris whitish yellow.

b. ♀ ad. Sapucay, June 10, 1903. Wing 5·8 inches ; tail 3·65.

Bill black ; tarsi and feet purple-red ; iris light brown.

These birds belong to the species described by Count Salvadori as *L. callauchen* from specimens obtained by Dr. Borelli in the Province of Jujuy near Salta in Northern Argentina. *L. callauchen* belongs to the section of *Leptoptila* which contains *L. bahia* and *L. reichenbachi*, having a deeper-coloured vinous breast than *L. chloroauchenia*, of which Mr. Foster has also sent an example. From the latter *L. callauchen* differs in the more olive-green colour of the back and in the hind-neck being of a lilac-brown with slight violet reflexions, but no metallic green as in *L. chloroauchenia* ; lores and forehead white, merging into pearly grey on the middle of the crown, *L. chloroauchenia* being much darker grey on the crown, and white, not vinous, on the lores, sides of face, and ear-coverts ; sides of neck and entire breast dark cinnamon-vinous, paler on the lower throat and inclining to white on the chin ; sides of body and flanks brown, the latter darker than the sides of the breast. This colour is scarcely perceptible in *L. chloroauchenia*.

12. GEOTRYGON VIOLACEA.

Paloma roxa y amarillo Azara, Apunt. iii. p. 15, no. cccxxi. (1805).

Columba violacea Temm. Fig. i. fam. iii. p. 67, pl. 29 (1808-11).

Geotrygon violacea Salvad. Cat. B. Brit. Mus. xxi. p. 565.

In the 'Biologia Centrali-Americana' (Aves, iii. p. 265) Dr. Godman has separated *G. albiventer* Lawr., from Pauama, from *G. violacea* of Brazil. Cf. also Hellmayr, Nov. Zool. xiii. p. 384 (1906). I take the same view, as I can see some small but apparently constant differences between the two forms. *G. violacea* has somewhat less of the lilac-blue metallic gloss on the mantle, the forehead being pearly grey like the cheeks ; the sides of the body have a sandy-buff tint. In *G. albiventer* the sides of the body are pink like the chest ; the forehead and cheeks are pale vinous, and the metallic lilac-blue on the mantle is much more intense.

a. ♂ ad. Sapucay, May 15, 1903.

Bill deep crimson; feet crimson; iris orange-brown.

b. ♀ ad. Sapucay, August 31, 1904.

Mr. Foster considers this bird to be very rare in Central Paraguay.

Count Salvadori (Cat. B. Brit. Mus. xxi. p. 565) refers Azara's bird to *G. montana*, but the description is evidently that of *G. violacea*, and the specimens sent by Mr. Foster confirm this, as also does the series in the British Museum. The bird described by Azara does not appear to have been named by Vieillot.

13. LIMNOPARDALUS RYTHIRHYNCHUS.

Yapacahá pardo Azara, Apunt. iii. p. 220. no. cccclxxii. (1805).

Rallus rythirhynchus Vieill. N. Dict. d'Hist. Nat. xxviii. p. 549 (1819, ex Azara).

Limnopardalus rythirhynchus Sharpe, Cat. B. Brit. Mus. xxiii. p. 29 (1894); Ihering, Revista Mus. Paulista, vi. p. 342.

a. ♂ ad. Sapucay, November 18, 1902.

This specimen, which is in full plumage, agrees with Vieillot's description.

14. LIMNOPARDALUS NIGRICANS.

Ypacahá obscuro Azara, Apunt. iii. p. 219. no. cccclxxi. (1805).

Rallus nigricans Vieill. N. Dict. d'Hist. Nat. xxviii. p. 560 (1819).

Limnopardalus nigricans Sharpe, Cat. B. Brit. Mus. xxiii. p. 31.

a. ♀ ad. Sapucay, October 15, 1902.

Iris red, tinged with brown.

b. ♀ ad. Sapucay, March 29, 1904.

Bill bronze-green; tarsi and feet coral-red; iris orange-red.

15. ARAMIDES CHIRICOTE.

Chiricote Azara, Apunt. iii. p. 214. no. cccclxviii. (1805).

Rallus chiricote Vieill. N. Dict. d'Hist. Nat. xxviii. p. 551 (1819).

Aramides cayennensis Berlepsch (nec Gm.), J. f. O. 1887, p. 125.

Aramides chiricote Sharpe, Cat. B. Brit. Mus. xxiii. p. 58.

Aramides cajanea chiricote Ihering, Revista Mus. Paulista, vi. p. 342.

a. ♂ ad. Sapucay, September 4, 1904.

Bill pea-green, becoming olive-green towards the base; tarsi and feet purplish red; iris crimson.

According to Mr. Foster, this species is resident and fairly common along the swampy streams of the forest and also on the edges of the large swamps.

The bird takes its name from the manner in which it calls in the evening "*Cherico cherico-co-co.*"

This is the first time that I have had the opportunity of examining a specimen of this species from Paraguay, which is the habitat of the "*Chiricote*" of Azara.

I have compared it with the series determined by Dr. Sharpe in the British Museum, and find that Mr. Foster's specimen agrees with others from New Granada and Brazil and differs only in the rather paler grey thighs.

16. PORPHYRIOLA MARTINICA.

Fulica martinica Linn. Syst. Nat. i. p. 259 (1766).

Yahanà celeste y verde Azara, Apunt. iii. p. 243. no. cccclxxx. (1805).

Yahanà blanco y celeste Azara, t. c. p. 248. no. cccclxxxi.

Yahanà blanco y pardo acanelado Azara, t. c. p. 251, no. cccclxxx.

Yahanà garganta celeste Azara, t. c. p. 253. no. cccclxxxiii.

Porphyrio cyanoleucos Vieill. N. Diet. d'Hist. Nat. xxviii. p. 27 (1819, ex Azara).

Porphyrio cyanicollis Vieill. t. c. p. 28.

Ionornis martinica Berlepsch, J. f. O. 1887, p. 125 (Paraguay).

Porphyriola martinica Sharpe, Cat. B. Brit. Mus. xxiii. p. 189; Ihering, Revista Mus. Paulista, vi. p. 343.

a. ♂ ad. Sapucay, October 29, 1902.

Iris very light brown.

17. *BELONOPTERUS CAYENNENSIS.*

Terutéro ó Tetéu Azara, Apunt. iii. p. 264. no. ccclxxxvi. (1805).

Vanellus cayanensis (Gm.), Vieill. N. Dict. d'Hist. Nat. xxxv. p. 206 (1819); Hartl. Ind. Azara, p. 24. no. 386 (1847); Berlepsch, J. f. O. 1887, p. 125 (Paraguay).

Belonopterus cayanensis Sharpe, Cat. B. Brit. Mus. xxiv. p. 163 (1896); Oates, Cat. Eggs Brit. Mus. ii. p. 14 (1902); Ihering, Revista Mus. Paulista, vi. p. 343.

Two clutches of eggs sent by Mr. Foster were collected in October. The ground-colour is ochraceous buff, spotted and blotched with black and chestnut-brown, with underlying spots of greyish purple. The measurements are: axis 1.75 to 1.9 inches; diameter 1.25 to 1.3.

[Owing to the great difference between Argentine and Paraguayan territory, the Teru Teru is by no means abundant, and in the neighbourhood of Sapucay is quite a rare bird. The wide level camp-lands of the south give place to smaller patches of open lands here, and the high rank grasses make it no fit place for a runner such as the Teru Teru. It can still be met with sparingly in swampy districts, but in the wooded parts which are general throughout Central Paraguay, its call is but seldom heard.—*W. F.*]

18. *HELODROMAS SOLITARIUS.*

Chorlito pardo menor Azara, Apunt. iii. p. 315. no. cccc. (1805).

Tringa solitaria Wils. Amer. Orn. vii. p. 53, pl. 58. fig. 3 (1813).

Totanus punctatus Vieill. N. Dict. d'Hist. Nat. vi. p. 411 (1816, ex Azara).

Totanus solitarius Berlepsch, J. f. O. 1887, p. 37 (Pilcomayo).

Helodromas solitarius Sharpe, Cat. B. Brit. Mus. xxiv. p. 444; Ihering, Revista Mus. Paulista, vi. p. 343.

a. ♂ ad. Sapucay, August 26, 1904.

[This species is apparently resident throughout the swampy parts of the country, and can generally be met with, although

its habits make it difficult to shoot. Its flight when flushed is only for a few yards, and nothing will again induce it to rise, the high tangled grass affording ample cover.

In this district it is a rare bird.—*W. F.*]

19. GALLINAGO PARAGUAYÆ.

Becasina prima Azara, Apunt. iii. p. 271. no. cccclxxxvii. (1805).

Scolopax paraguayæ Vieill. N. Dict. d'Hist. Nat. iii. p. 356 (1816).

Gallinago paraguayæ Berlepsch, J. f. O. 1887, p. 36 (Pilcomayo); Sharpe, Cat. B. Brit. Mus. xxiv. p. 650; Oates, Cat. Eggs Brit. Mus. ii. p. 63; Ihering, Revista Mus. Paulista, vi. p. 343.

a. ♂ ad. Ybytimi, February 3, 1904.

Three clutches of the eggs of this species were sent. They were collected during the months of October, November, and January. The ground-colour is olive, blotched and marbled with blackish to dark umber-brown, with pale underlying spots of purple. The blotches cluster at the larger end. The measurements are: axis 1·55 to 1·6 inches; diameter 1·1 to 1·2.

[Resident and fairly common through the country, although, compared with the Argentine, it is rare; but, generally speaking, specimens can always be met with along the water-courses and small swamps which are found within every few hundred yards here.—*W. F.*]

20. PARRA JACANA.

Parra jacana Linn. Syst. Nat. i. p. 259 (1766); Berl. J. f. O. 1887, p. 35 (Pilcomayo); Ihering, Revista Mus. Paulista, vi. p. 343.

Jacana jacana Sharpe, Cat. B. Brit. Mus. xxiv. p. 82 (1896).

a. ♂ imm. Ybytimi, February 5, 1904.

Bill of a greenish horn-colour; tarsi and feet greyish green; iris olive-yellow.

This young bird was shot in a swamp. It is very similar to that described by Dr. Bowdler Sharpe (Cat. B. Brit. Mus. xxiv. p. 82), but has the chestnut colour of the adult plumage just appearing.

Ybytimi is twenty miles south-east of Sapucay, and a very similar district [*W. F.*].

21. POLYBORUS THARUS.

Falco tharus Molina, Saggio St. Nat. Chil. p. 264 (1782).

Caracará Azara, Apunt. i. p. 42. no. iv. (1802).

Polyborus vulgaris Vieill. N. Dict. d'Hist. Nat. v. p. 257 (1816, ex Azara).

Polyborus tharus Sharpe, Cat. B. Brit. Mus. i. p. 31 (1874); Berlepsch, J. f. O. 1887, p. 122 (Paraguay); Ihering, Revista Mus. Paulista, vi. p. 337.

a. ♂ ad. Sapucay, August 19, 1904.

Cere and bare skin round the eye of a deep salmon-colour; tarsi and feet yellow; iris bright brown.

[Resident and not uncommon in this district: it invariably goes in pairs all the year round. Its food consists almost exclusively of grasshoppers, frogs, and small snakes. I have never noticed any carrion propensities in the Paraguayan specimens.

As the bird is never interfered with, it has become wonderfully tame, and horsemen can approach it to within a few yards: it will then fly quietly to one side.—*W. F.*]

22. MILVAGO CHIMANGO.

Chimango Azara, Apunt. i. p. 47. no. v. (1802).

Polyborus chimango Vieill. N. Dict. d'Hist. Nat. v. p. 260 (1816).

Ibycter chimango Sharpe, Cat. B. Brit. Mus. i. p. 41 (1874).

Milvago chimango Hartl. Ind. Azara, p. 1 (1847); Berlepsch, J. f. O. 1887, p. 122 (Paraguay); Sharpe, Hand-list B. i. p. 244 (1899); Ihering, Revista Mus. Paulista, vi. p. 337.

a. ♂ ad. Ybytimi, February 10, 1904. Bill, tarsi, and feet yellow; iris clear light brown.

This specimen had not quite completed its moult, as may be seen from the fact that many of the old feathers on the breast, as well as on the upper parts, have lost their webs, which are abraded so that the shafts remain quite bare for a considerable portion of their length.

23. *MICRASTUR RUFICOLLIS*.

Micrastur ruficollis (part.) Sharpe, Cat. B. Brit. Mus. i. p. 76 (1874); id. Hand-list B. i. p. 246 (1899); Ihering, Revista Mus. Paulista, vi. p. 337.

Thrasycaccipiter seminocturnis Bertoni, Aves Nuev. Paraguay, p. 164 (1901).

Sparvius ruficollis (nec Vieill.), Richmond, Proc. U.S. Nat. Mus. xxxv. p. 645 (1908).

Mr. Bertoni has described the Paraguayan bird as a new form and placed it in a new genus under the title of *Thrasycaccipiter seminocturnis* (cf. Bertoni, *l. c.* p. 164), but according to Dr. Ihering and Mr. C. W. Richmond it is identical with *Micrastur ruficollis*.

a. ♀ ad. Sapucay, July 5, 1904.

Bill black; tarsi and feet pale green in front and bright yellow behind; iris brown.

b. ♂ ad. Sapucay, August 18, 1904.

Bill black, cere and circle round the eyes yellow; tarsi and feet yellow; iris pale brown.

The male bird received from Mr. Foster is in full adult plumage, and compared with the specimens of *M. ruficollis* in the National Collection is of a darker slate-colour above, as also on the sides of the neck, cheeks, and ear-coverts. The white bars on the tail-feathers are fewer in number, narrower, and, in some cases, scarcely perceptible. The throat is somewhat darker and the rufous patch on the breast stands out in greater contrast. The dark bars on the under surface of the body are narrower and more numerous. Total length 14.6 inches; culmen, from base of forehead, 0.6; wing 6.5; tarsus 2.1; middle toe and claw 1.55.

The female is darker chocolate-brown above than any females of *M. ruficollis* in the Museum, and has the head blackish; the white bars on the tail-feathers are narrower

and more numerous; the rufous colour on the chin, throat, fore-neck, and sides of neck is darker and duller; the dark bars on the under surface are blacker and much broader; the white bar on the sides of the upper neck is broad and well pronounced. Total length 14·6 inches; culmen, from base of forehead, 0·75; wing 6·8; tail 6·8; tarsus 2·55; middle toe and claw 1·45.

24. *PARABUTEO UNICINCTUS.*

Gavilan mixto obscuro y canela Azara, Apunt. i. p. 94. no. xix. (1802).

Falco unicinctus Temm. Pl. Col. i. pl. 313 (1824: Rio Grande, Brazil).

Buteo unicinctus Hartl. Ind. Azara, p. 2. no. 19 (1847).

Antenor unicinctus Berlepsch, J. f. O. 1887, p. 27 (Lambaré).

Parabuteo unicinctus Sharpe, Hand-list B. i. p. 247 (1899); Ihering, Revista Mus. Paulista, vi. p. 337.

a. ♀ imm. Sapucay, May 28, 1903. Bill of a slate-colour; cere yellowish green; tarsi and feet yellow; iris brown.

Mr. Foster says that this specimen was shot on the edge of the forest.

25. *ACCIPITER PILEATUS.*

Esparvero azulero Azara, Apunt. i. p. 118. no. xxvi. (1802).

Falco pileatus Temm. Pl. Col. i. pl. 205 (1823: Brazil).

Accipiter pileatus Hartl. Ind. Azara, p. 2 (1847); Sharpe, Cat. B. Brit. Mus. i. p. 153 (1874); Berlepsch, J. f. O. 1887, p. 122 (Paraguay); Ihering, Revista Mus. Paulista, vi. p. 337.

a. ♀ ad. Sapucay, October 18, 1902. Iris orange-red.

This specimen, which is in full plumage, has the back of a dark slate-colour with black shaft-lines; crown black; upper wing-coverts dark brown; tail banded with brown and black; under surface of body of a pale slate-colour with black shaft-streaks; under tail-coverts whitish; thighs, under wing-coverts, and axillaries rufous.

I can find no difference between this example and others from Brazil.

Three eggs, collected on October 19, 1902, are dull white without any markings beyond a few underlying cloudings of a somewhat darker tint. The measurements are: axis 1·8 to 1·9 inches; diameter 1·4 to 1·5.

26. *HETEROSPIZIAS MERIDIONALIS.*

Falco meridionalis Lath. Ind. Orn. i. p. 36 (1790: Cayenne).

Gavilan de estero acanelado Azara, Apunt. i. p. 72. no. xi. (1802).

Buteo rutilans Hartl. Ind. Azara, p. 1 (1847).

Heterospizias meridionalis Sharpe, Cat. B. Brit. Mus. i. p. 160; Berlepsch, J. f. O. 1887, p. 123 (Paraguay); Ihering, Revista Mus. Paulista, vi. p. 337.

a. ♀ ad. Sapucay, August 14, 1904. Bill blackish above, grey below, yellow at base; feet light orange-yellow; iris warm light brown.

[This species is somewhat rare, but widely distributed through Central and Southern Paraguay.—*W. F.*]

27. *RUPORNIS PUCHERANI.*

Esparvero ceja blanca Azara, Apunt. i. p. 116. no. xxv. (1802).

Esparvero indayé Azara, t. c. p. 131. no. xxx.

Asturina pucherani J. & E. Verreaux, Rev. et Mag. de Zool. 1855, p. 350 (South America); Sharpe, Cat. B. Brit. Mus. i. p. 205 (1874).

Rupornis nattereri saturata Berlepsch, J. f. O. 1887, p. 28 (Lambaré).

Rupornis pucherani Sharpe, Hand-list B. i. p. 257 (1899).

Potamolegus superciliaris, var. *furvicollis* Bertoni, Aves Nuev. Paraguay, p. 161 (1901), = *Rupornis pucherani* Ihering, Revista Mus. Paulista, vi. p. 337, = *Asturina pucherani*, Richmond, Proc. U.S. Nat. Mus. xxxv. p. 635 (1908).

a. ♀ ad. Sapucay, May 2, 1903.

Bill of a slate-colour, black at tip; cere and bare skin round the eye yellow; tarsi and feet orange-yellow; iris yellow.

b. ♀ imm. Sapucay, August 31, 1904.

This young bird has five black bands on the tail, whereas there are only four in the adult bird. The upper tail-coverts are white in the young with black bars or heart-shaped spots, but in the old bird the upper tail-coverts are sandy buff with rufous bars.

The under surface is very different from that of the adult, the throat and chest being white with longitudinal brown centres to the feathers, the entire breast and abdomen also white, transversely barred with brown (these bars less distinct on the lower abdomen and reduced to small terminal spots on the under tail-coverts), and the thighs slightly more sandy buff and somewhat closely barred with brown.

The old bird is altogether more rufous below, the throat being blackish with a few streaks of sandy buff, the feathers of the fore-neck and chest pale ferruginous with blackish shaft-lines and sandy-buff edges to the feathers, the breast and abdomen regularly barred with pale ferruginous on a sandy-buff ground, the bars rather narrower on the lower flanks and abdomen and reduced to narrow and incomplete heart-shaped or V-shaped bars on the under tail-coverts; the thighs brighter sandy rufous, with dull ferruginous bars, not very distinct, while this colour of the thighs stands out in contrast to the pale colour of the abdomen.

Mr. Bertoni has separated this bird under the name of *Potamolegus superciliaris*, var. *furvicollis* (cf. Bertoni, *l. c.* p. 161), but according to Dr. Ihering and Mr. C. W. Richmond it is inseparable from *Rupornis pucherani*.

28. URUBITINGA URUBITINGA.

Brazilian Eagle Lath. Gen. Syn. i. p. 41 (1781: Brazil).

Falco urubitinga Gm. Syst. Nat. i. p. 265 (1788, ex Lath.).

Gavilan mixto chorreado Azara, Apunt. i. p. 88. no. xvii., juv. (1802).

Gavilan mixto pintado Azara, t. c. p. 92. no. xviii., juv.

Gavilan mixto negro Azara, t. c. p. 96. no. xx., adult.

Urubitinga zonura Sharpe, Cat. B. Brit. Mus. i. p. 213 (1874).

Hypomorphnus urubitinga Berlepsch, J. f. O. 1887, p. 28 (Lambaré).

Urubitinga urubitinga Sharpe, Hand-list B. i. p. 258 (1899); Ihering, Revista Mus. Paulista, vi. p. 338.

a. ♂ imm. Sapucay, March 8, 1904.

Bill of a dark horn-colour; tarsi and feet yellow; iris golden brown.

This specimen is in full plumage, but retains a little of the immature rufous colour on the breast and sides of the neck.

29. *ICTINIA FLUMBEA.*

Falco plumbeus Gm. Syst. Nat. i. p. 283 (1788 : Cayenne).

Alcon azulejo Azara, Apunt. i. p. 167. no. xxxvii. (1802).

Ictinia plumbea Vieill. N. Dict. d'Hist. Nat. xvi. p. 76 (1817 : Paraguay); Sharpe, Cat. B. Brit. Mus. i. p. 364 (1874); Berlepsch, J. f. O. 1887, p. 123 (Paraguay); Ihering, Revista Mus. Paulista, vi. p. 339.

a. ♀ ad. Ybytymi, January 31, 1904.

Bill black; tarsi and feet orange-chrome; iris crimson.

30. *FALCO ALBIGULARIS.*

Falco albogularis Daud. Traité, ii. p. 131 (1800 : Cayenne); Sharpe, Cat. B. Brit. Mus. i. p. 401 (1874); Kerr, Ibis, 1892, p. 142 (Lower Pilcomayo); Ihering, Revista Mus. Paulista, vi. p. 339.

Hypotriorchis melanogyne Bertoni, Aves Nuev. Paraguay, p. 168 (1901 : Alto Parana), cf. Ihering, l. c.

a. ♀ ad. Sapucay, March 26, 1904.

Bill of a slate-colour; cere and circle round the eye yellow; tarsi and feet pale orange.

31. *CERCHNEIS AUSTRALIS.*

Falco sparverius var. *australis* Ridgway, Hist. N. Amer. B. iii. p. 166 (1874 : Parana).

Cerchneis sparveria cinnamomina Berlepsch, J. f. O. 1887, p. 123 (Paraguay).

Tinnunculus sparverius cinnamominus Ihering, Revista Mus. Paulista, vi. p. 339.

a. ♀ ad. Sapucay, November 30, 1902.

Iris light warm brown.

b, c. ♂ ; d, e. ♀ ad. Sapucay, April 25, 1904.

Bill of a slate-colour at the tip, lighter at the base; cere and bare skin round the eyes yellowish; feet buff, claws black; iris brown.

The two males have blue heads with a little patch of rufous on the occiput. One has the back almost devoid of black bars, whereas in the other, obtained on the 25th of April, there are numerous broad black bars. The hen birds, whether they have blue heads or a little rufous on the crown, are always distinguished by the brown streaks on the breast and sides of the body, whereas in the male these parts have black spots, very distinct on the sides.

Four eggs were sent, collected on November 29, 1902. Three of these have a whitish ground-colour: one has minute chestnut-coloured spots evenly distributed over the entire surface, except at the larger end, where there are scarcely any at all; the second is similar, but has large blotches of chestnut-colour at the larger end; the third has a cluster of blotches of the same colour at the large end; while the fourth has a reddish ground-colour with large spots distributed over the entire surface of the egg.

[Resident and common all through Paraguay, nesting invariably in holes of trees. Along the streams which flow through the open camps and in the southern province, it lives to a very great extent upon fish and small reptiles. I have only seen the birds singly, never in pairs, and the nesting-habits are unknown to me.—*W. F.*]

32. PIZORHINA CHOLIBA.

Chóliba Azara, Apunt. i. p. 218. no. xlvi. (1802).

Strix choliba Vieill. N. Dict. d'Hist. Nat. v. p. 39 (1817, ex Azara).

Scops brasiliensis (nec Gm.), Sharpe, Cat. B. Brit. Mus. ii. p. 108 (1875); Berlepsch, J. f. O. 1887, pp. 27, 122 (Lambaré); Kerr, Ibis, 1892, p. 141 (Rio Paraguay); Oates, Cat. Eggs Brit. Mus. ii. p. 328.

Pizorhina choliba Ihering, Revista Mus. Paulista, vi. p. 336.
a, b. ♀ ad. Sapucay, October 1902.

Both of these specimens are of the dark phase, and in full adult plumage, with rufous thighs and tarsi.

c. ♂ ad. Sapucay, March 24, 1904.

This bird is of the red phase, whitish below with bold longitudinal dark streaks; the thighs, tarsi, and feet are pale rufous, becoming whitish towards the toes.

d. Ad. Sapucay, May 3, 1904.

Bill and toes of a greenish slate-colour; iris yellow. This example is somewhat intermediate in colour between the dark and red phase.

Two eggs collected on October 14, 1902, and three others obtained on October 20, 1903, are dull white in colour and measure: axis 1.3 to 1.4 inches; diameter 1.15 to 1.25.

33. GISELLA IHERINGI.

Gisella iheringi Sharpe, Bull. B. O. C. vii. p. xl (1899: São Paulo, Brazil); id. Hand-l. B. i. p. 295 (1899).

a. ♀ imm. Sapucay, September 28, 1902.

This bird is blackish brown above, somewhat darker on the head and nape, with tawny bases to the feathers of the hind-neck and scapulars; wing-coverts similar in colour to the back, with white spots on the outer webs towards the tips; primary-coverts blackish, with a white spot on the inner webs; primary and secondary quills blackish-brown, with white spots on both webs; upper tail-coverts like the back; tail-feathers black, with white spots on both webs, the two white spots at the tips of the feathers almost confluent; forehead to the middle of the crown of a buff-colour, somewhat paler and more extended on the sides of the latter; lores and eyebrows black, as also the ear-coverts, this same colour extended in a line towards the sides of the throat; on the middle of the throat a black patch extending in a line on to the sides of the neck; cheeks, sides of face, sides of neck, sides of body, and entire under surface tawny rufous; under wing-coverts buff; quills brown below.

Total length 8·3 inches ; culmen 0·8 ; wing 5·7 ; tail 2·5.

The species was only known previously by the type (with which this specimen has been compared) described by Dr. Bowdler Sharpe (*cf. supra*) as from São Paulo, Brazil. Dr. Ihering, however, has written to say that the type specimen came from S. Lourenço, Rio Grande do Sul ('Ibis,' 1900, p. 217).

This bird is new to the avifauna of Paraguay.

34. SPEOTYTO GRALLARIA.

Strix cunicularia (nec Linn.), Molina, Sagg. St. Nat. Chil. p. 343 (1782).

Urucureá Azara, Apunt. i. p. 214, no. xlvi. (1802).

Strix grallaria Temm. Pl. Col. i. pl. 146 (1822).

Athene cunicularia Hartl. Ind. Azara, p. 4 (1847).

Speotyto cunicularia Sharpe, Cat. B. Brit. Mus. ii. p. 142 ; Berlepsch, J. f. O. 1887, p. 122 (Paraguay) ; Ihering, Revista Mus. Paulista, vi. p. 336.

Speotyto cunicularia grallaria Hellmayr, Abhandl. Akad. München, xxii. p. 574 (1906).

a. ♀ ad. Sapucay, May 25, 1903.

Bill and claws greenish yellow.

This specimen has an admixture of rufous streaks on the head and back of neck, and a rufous wash on the abdomen.

b. ♂ ad. Sapucay, June 5, 1904.

Iris yellow.

This example is much paler both on the upper and under surface, and shews no trace of rufous such as is observed in the female. The feathers are much worn and abraded.

[Resident and widely distributed throughout Paraguay, but nowhere common. The favourite post of observation is the top of one of the ant-hills which are to be met with everywhere. I have never observed it in the forests ; and in wooded districts it is only seen occasionally, the conditions being very different when the ground is entirely concealed from sight by the rank vegetation which forms a curtain many feet thick.—*W. F.*]

35. *GLAUCIDIUM BRASILIANUM*.

Strix brasiliana Gm. Syst. Nat. i. p. 289 (1788).

Carbué Azara, Apunt. i. p. 225. no. xlix. (1802).

Strix ferox Vieill. N. Dict. d'Hist. Nat. vii. p. 22 (1817, ex Azara).

Glaucidium ferox Sharpe, Cat. B. Brit. Mus. ii. p. 200; Berlepsch, J. f. O. 1887, p. 122 (Paraguay).

Glaucidium brasilianum Berlepsch, Bull. B. O. C. xii. p. 8 (1901); Ihering, Revista Mus. Paulista, vi. p. 337.

Glaucidium brasiliense Berlepsch, t. c. p. 8.

Glaucidium ferox rufus Bertoni, Aves Nuev. Paraguay, p. 179 (1901); Ihering, l. c.

a, b. ♂ ad. Sapucay, April and May 1903.

Bill and claws yellow; iris golden. Shot in monte during the day.

c. ♂; *d, e.* ♀ ad. Sapucay, April and June 1904.

The male birds are darker and smaller, while the females are larger and more inclined to rufous in colour.

[This species is resident and by no means uncommon throughout the wooded districts of Central Paraguay. It is often to be met with tame in the native houses, and makes a pleasant little pet when young, but invariably makes for the forest when adult. Of course this is easy enough, as none of the houses are many yards distant from some wood. Although it is not rare I have never met with its nest, and know nothing whatever about its breeding-habits.—*W. F.*]

[To be continued.]

IV.—*On the Birds of Northern Rhodesia and the Katanga District of Congoland.* By S. A. NEAVE, M.A., B.Sc., F.Z.S., M.B.O.U.

(Plates I. & II., and Text-fig. 2.)

THE following paper deals chiefly with the birds that I collected during my second expedition in the years 1907 and 1908; the former year (1907) having been spent in Katanga, and the latter (1908) mainly in the more northern